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**Patent Disclosure DE 196 49 636 A1**

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Oppositions: DE 44 22 849 C1  
DE 43 39 604 C2  
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Following statements are taken from the files submitted by the applicant

**Use of an Adhesive Tape Section**

Use of a section of adhesive tape with a region with adhesive and a handle for residue and destruction free release of the adhesive joint, whereby the section of adhesion tape is such that it can be released by pulling / stretching in the plain of the adhesion, characterized by handles being provided on at least two sides of the tacky region with which the adhesive joint can be released by pulling / stretching in the adhesion plain.

### Description

The invention concerns the use of a section of an adhesive tape for residue free and damage free release of the adhesive joint by pulling / stretching in the adhesive plain.

Single or double sided, tacky adhesive tapes (adhesive films) highly deformable elastically or plastically by stretching are known, which can be released by pulling mainly in the direction of the plain of adhesion. Adhesive joints established with them offer a strong mount and can still be released again without traces, and without or very little damage to the substrate or the glued object. Examples of adhesive tape of the above mentioned kind have been described in US 4,024,312, DE 33 31 016, DE 42 22 849, WO 92/11332, WO 92/11333, US 5,516,581, and WO 95/06691. A common packaging form of products of this kind are cuts from tacky adhesive tapes, for example in form of rectangular strips which have a handle region free of adhesive on one end (see DE 42 22 849, WO 92/11333 or US 5,516,581). The handle serves as a surface to grab the adhesive tape for removal later on.

Practical problems with the above mentioned products are encountered when the tacky adhesive tape breaks during the release process in the case of a double sided, tacky adhesive tape. This problem is dealt with in particular in DE 42 22 849, DE 44 28 587, and DE 44 31 914. The adhesive tapes described in DE 42 22 849 use UV impenetrable handle covers which reduce the tendency of the handle in the handle region towards breakage after UV exposure, or prevent them. The adhesive tapes described in DE 44 28 587 are equipped with a particularly shaped end which works against a partial rupture of the adhesive tape towards the end of the release process. DE 44 31 914 describes adhesive tapes featuring special film or paper covers among other items in the handle region, which possess a lower adhesion towards the adhesive material utilized, which in turn reduces the tendency towards rupture of the handle which is free of adhesive. A general solution of the rupture problem is nevertheless still open.

Another problem of the adhesive tapes, which can be released mainly by stretching in the plain of adhesion, is that the shear force imposed during the release process on the adhesion substrate can experience partial damage or destruction itself. Especially DE 44 28 587 deals with this difficulty and promotes a solution with special geometric designs of the adhesive films at their end. However, this is difficult to realize with regard to a production free of waste. A general solution of this problem is still open.

A preferred area of application of releasable, tacky adhesive tapes for residue and damage free release by stretching mainly in the plain of the adhesion is the adhesion of flexible materials such as posters, for example. A covered adhesive joint should be obtained frequently in these cases because of aesthetic reasons, for example, i.e. the adhesive tape should remain completely behind the object to be glued in such a way that even the handle is not visible in glued condition. It is desirable to easily and simply find the handle for release. It has been found, however, in practical use that the customer has frequently

forgotten how the adhesive tape had been glued during the mounting and where the handle is located. The adhesive tape has possibly been glued accidentally or due to lack of knowledge in such a way that the region of the handle is located towards the inside of the poster, and is therefor not accessible, and the adhesive joint cannot be established again without damage or destruction of the object glued or the substrate.

- 2 -

The task of the presented invention was to overcome the above mentioned disadvantages, especially to obtain tacky adhesive tapes which:

- can be released residue and destruction free by stripping, especially in the plain of the adhesive joint,
- can still be released residue and destruction free even in case of breakage during the release process, and
- with which the handle can be found simply and easily even with a covered adhesive joint of flexible materials, and especially
- where a wrongful mounting of the adhesive tape section is not possible.

This task is solved by the use of a section of adhesive tapes as characterized in more detail in the claims, especially

- by adhesive film sections which can be released by stretching in the plain of adhesion residue and destruction free, and
- possess handles or handle regions which
- border on a central, tacky region, whereby
- handles or the handle regions point away in several directions from the central, tacky region.

### Application Examples

Residue and destruction free, releasable adhesive tapes for:

- mounting of posters, pictures, calendars, post cards, signs, tacky hooks, also pre-fabricated;
- preferably for gluing flexible materials, so that the handle region can be easily found and wrongful adhesive mounts are precluded, for example not accessible handle regions.

Useable according to the invention are highly stretchable, elastic adhesive tapes, or also adhesive tapes which can deform plastically during elongation, which are suitable for the adhesive joint and which can be released residue and damage free by pulling mainly in the direction of the adhesive plain, corresponding among others to US 4,024,312, DE 33 31

016, WO 92/11332, US 5,516,581, and WO 95/06691. Adhesive tapes can be tacky on one or both sides, or also be equipped on one or both sides with a thermally activated adhesive material. Their structure can be composed of a single layer or of multiple layers. Elastically or plastically deformable materials can be used as intermediate backings in case of double sided, tacky adhesive tapes. Intermediate layers and foam-containing intermediate layers as adhesive materials are especially included with it besides polymer films.

The invention shall be illustrated in the following by design examples and figures without unnecessarily trying to limit it. Shown are in

- 3 -

Fig. 1 a top view of an adhesive tape section according to the invention,

Fig. 2a, 2b, 2c, 2d, and Fig. 3 a top view each of other design forms.

Adhesive tape sections 1 are shown each in these Figures 1, 2a-d, and 3, with a tacky region 2 and a handle or handle region 3.

Adhesive tapes of this invention are utilized in packaged form, for example, in form of punched parts or cuts. Packaged product features a central, tacky region. Located bordering it are several, but at least two handle regions. Located around a central, tacky region is a continuous, peripheral handle region (Fig. 1) in a special design version.

Preferred design versions are those with two handle regions opposite to each other (Fig. 2a), with three handle regions arranged at an angle of  $120^\circ$ , and with four at an angle of about  $90^\circ$  from each other (Fig. 2b, c, d).

An especially preferred design version is that of an equal sided triangle. The points of the triangle form the three handle regions, the tacky region is in the middle (Fig. 3). The handle regions are designed such that the border to the tacky inner region is convex to the triangle points. This allows for a larger adhesion surface area relative to the total area of the adhesive tape section. The tacky regions opposite to the points of the triangle proceed at the same time at a steep angle. This way the advantages of DE 44 28 578 can be utilized.

All figures are to be understood as examples taken from a multitude of additional possibilities.

Packaging forms comprise both adhesive tape pieces of defined dimensions, for example in form of stamped parts or cuts, as described before, as well as adhesive rolls with which the user will finally determine the shape of the appropriate tacky adhesive tape, for example by

cutting. Examples of adhesive tape rolls like this are, for example, a double sided adhesive tape covered with release paper, whose adhesive material surface has been inerted at both edge regions, for example, by placement of a thin polyester film. Shapes can be obtained by simple cutting from the previous roll according to Fig. 2a.

Adhesive tapes of this invention can be obtained based on single or double sided, tacky adhesive tapes, which can be released residue and destruction free mainly by stretching in the direction of the adhesive plain, by partially inerting the adhesive surface of said adhesive tapes.

Inerting the adhesive material surface can be achieved by covering it, for example, with thin films made out of polymer, for example, or by covering it with thin paper. As alternative, inerting of a coating or print can be achieved by means of non-tacky resins or non-tacky powdery materials. Preferred inerting is achieved according to DE 44 31 914.

The possibility exists as an alternative in obtaining the tacky adhesive tapes of this invention by selective coating of suitable, non-tacky backing materials. In this case the handle regions are provided through the backing, which is partially coated or printed with adhesive material in such a way that the handle regions are not covered with adhesive.

- 4 -

Preferably the inerting of the adhesive material surface area or of the coating of a suitable backing with adhesive material is conducted about evenly in area on both sides for double sided, tacky adhesive films.

## Examples

### Example 1

12  $\mu\text{m}$  thick single sided, siliconized polyethyleneterephthalate film sections (Hostaphan RN 12) each of dimensions 15 mm x 15 mm are placed with the siliconized side facing the adhesive on both sides at both ends in length on a single layer adhesive film on styrene-block-copolymer basis (Recipe I) of dimensions 70 mm x 15 mm x 1 mm (Length x Width x Thickness). The tacky central regions of the adhesive film obtained this way are covered on both sides for protection with siliconized release paper. Four adhesive film pieces of this kind are used to mount a poster on a wall with painted rough, fiber wallpaper (wallpaper: Erfurt, corn 52; paint: Herbol Zenit LG; wallpaper glued to particle board). The release papers are removed for this purpose on one side from the adhesive film, after which the adhesive films freed on one side from release paper are fixed with their tacky side on the back side of the four corners of the poster in such a way that a covered adhesive joint of the poster can be carried out. The release papers on the back side of the adhesive films are removed in a second step and the poster is mounted. The handles are

visible in all cases by carefully folding the corners of the poster forward when releasing it, whereby a simple removal is made possible. Wrongful attachment as is possible only for single sided adhesive films equipped with a handle, if the handle has been attached in the direction towards the center of the poster, is not possible.

#### Recipe I

80 parts	Europrene Sol T 193B (EniChem)
20 parts	Vector 4261 (Exxon Chemicals)
100 parts	Foralyn 110 (Hercules)
1 part	Irganox 1010 (Ciba)

#### Example 1a

A foam containing backing on the basis of a ethylene-vinyl-acetate copolymer (Alveolit TEE 0500.8; Alveo AG; volume density =  $200 \text{ kg/m}^3$ ) according to Example 1 is laminated on both sides with a  $250 \mu\text{m}$  thick adhesive layer of Recipe I. For this purpose the chosen foam material is placed on the adhesive material present on the siliconized release paper, and afterwards rolled five times with a rubber coated steel roll of 25 cm width at a contact pressure of 50 N. The intermediate product obtained this way is coated in identical manner on the second side with adhesive material. Afterwards, adhesive film cuts are produced analogous to Example 1 which are equipped at the end on both sides with single sided, siliconized polyester film sections as handles measuring 15 mm x 15 mm. Adhesive joints are made of the samples obtained this way after 24 hours of conditioning in a climate controlled chamber (50% rel. humidity,  $T = T_R = 23^\circ \text{C}$ ). A poster is mounted according to Example 1 on a painted, rough fiber wallpaper with four of the adhesive film strips obtained. It can be observed at slow stripping of the adhesive film strips towards the end of the release process, when the maximum shear stress is imposed on the substrate, that a small amount of paint is pulled from the surface of the painted rough fiber wallpaper.

- 5 -

However, if both handles are grabbed at the same time and mainly pulled diametrically apart in the direction of the handles, mainly in the plain of adhesive plain, then a significantly smaller part of the force used for the release is imposed on the wallpaper. Correspondingly, an absolutely destruction free release can be proven.

#### Example 2

1 mm thick, circular, single layer adhesive film stamping parts (adhesive material according to Recipe I) with a diameter of 60 mm are made to be tacky-free by powdering an edge region of 20 mm with titanium oxide (Kronos 2210) according to Fig. 1. A

poster is mounted following Example 1. A smooth, Formica-coated particle board is used as adhesion substrate. The handle can be found readily for the release process because of the circular handle region. Wrongful attachment as is possible only for single sided adhesive films equipped with a handle, if the handle has been attached in the direction towards the center of the poster, is not possible.

### Example 3

Adhesive film pieces of equal sided triangular form with a side length of 60 mm and a thickness of 1 mm (adhesive material according to Recipe I) are covered evenly on both sides according to Example 3 with a 12  $\mu$ m thick, single sided siliconized polyester film. The tacky central region of the adhesive film obtained this way is covered for protection purposes on both sides with siliconized release paper. The adhesive film pieces obtained this way are especially suitable for a destruction free release from even very sensitive substrates because of the acute angle shape of the handles located opposite to the tacky regions.

A destruction free release is possible even when a handle breaks (caused, for example, by very rapid stretching of the adhesive film, starting from the handle, whereby the latter is only grabbed at the outer end) by the two remaining handles.

### Patent Claims

1. Application of a section of adhesive tape with a region with adhesive and a handle for residue and destruction free release of the adhesive joint, whereby the section of adhesion tape is made such that it can be released by pulling / stretching in the plain of the adhesion, **characterized by** a handle being provided on at least two sides of the tacky region with which the adhesive joint can be released by pulling / stretching in the plain of adhesion.
2. Application according to Claim 1, characterized by the adhesive film section being equipped to be tacky on both sides.
3. Application according to Claim 1, characterized by the adhesive tape section consisting of a highly extensible, by elongation elastically or plastically deformable material, possibly equipped with an intermediate layer, especially with an intermediate layer made of film or foam.
4. Application according to Claim 1, characterized by the handles being arranged around the tacky region.

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5. Application according to Claim 1, characterized by the handles being arranged symmetrically to a fictitious central point of the adhesive tape section.

- 6 -

6. Application according to Claim 1, characterized by the handles covering regions which surround at least partially the tacky region.
7. Application according to Claim 1, characterized by the adhesive tape sections being designed to have multiple corners and that the handles are located in these corners.
8. Application according to Claim 1, characterized by the adhesive tape sections being circular and the handles in the outer region surrounding the entire tacky region.
9. Application according to Claim 1, characterized by the adhesive tape section being shaped triangular or rectangular, the handles being provided in the corners and surrounding the entire tacky region.
10. Adhesive tape section according to one of the claims 1-9.

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1 page of pertinent drawings

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Fig. 1

Fig. 2a

Fig. 2b

Fig. 2c

Fig. 2d

Fig. 3